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JAPANESE MEDICAL EQUIPMENT

FILTER, WATER, FIELD, FOR HOSPITAL USE

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Filter, Water, Field, for Hospital Use

SOURCE: Japanese Army Medical Supply Headquarters, TOKYO, JAPAN

IMPORTANCE: Not previously reported; use of filter paper for quantity filtration.

DESCRIPTION: The apparatus consists of a pump and two filters and is carried and operated in a chest 27½" long, 14" wide and 16" high. The chest is made of 15/16" wood reinforced at corners with bolted-on angle irons, and equipped with stout leather handles, a hinged top, a locking hasp, a wire mesh covered drain in the bottom, and standard Geneva markings at both ends. Bolted inside the back of the chest, are metal fixtures in which the filter assemblies slide and are held securely. The pump is bolted to the bottom of the chest, and a bearing for the pump handle is inserted in the front.

Through this bearing a 34" handle, when moved back and forth through a long arc, imparts a reciprocal motion to the shaft of the pump, which is double-acting, reciprocal, with a 2" bore and 3¼" stroke. Surge chamber, safety release valve, and pressure guage are provided. A three-way valve admits the pump effluent to either one or both of the two filters, which are connected to the pump with double-union tubing, permitting easy removal. Thus one filter may be removed and cleaned while the other is in operation.

Outside dimensions of the two identical filter assemblies are 12" x 10" x 2". They are made up of a front and back plate which when bolted together inclose the filter material between rubber gaskets. The filter material is composed as follows:

a. One wire mesh screen, $8\frac{1}{4}$" x $6\frac{1}{4}$" (to fill the void within the rubber gasket on the influent side of the filter)

b. One felt pad 9 3/8" x $7\frac{1}{2}$" x 3/16"

c. One or two sheets of heavy laboratory filter paper 9 3/8" x $7\frac{1}{2}$"

d. A second felt pad

e. A second wire mesh screen (to fill the void within the effluent gasket).

A larger rubber gasket incloses the whole filter and is of such thickness that most of the pressure of the closing bolts is exerted on the inside filters, so that if the outside one is watertight one can assume the inside ones are tighter and that no leakage is occurring between raw and filtered water. The effluent of each filter flows through a nipple protruding through the back of the chest.

Carried inside the chest are two wooden boxes and two cloth pouches, which contain the following accessories:

1. 11/16" hexagonal wrench
2. 11/16 hexagonal socket wrench
3. Union wrench
4. Screw driver

5. Crescent wrench
6. Metal priming pitcher
7. Union washers, 60 ea
8. Wire mesh screens, 8 ea
9. Felt pads, 8 ea
10. Filter papers, 24 ea
11. Pump gaskets, 2 ea
12. Asbestos pump packing
13. Oil can
14. Padlock and keys
15. Gauze mouth masks, common Japanese type (for use by operator when preparing filter) 12 ea.

COMMENT: This apparatus was designed by Lt. Col. Seitaro Yamaguchi, Pharmacy Corps, Japanese Army, who claims the capacity to be about 1 liter per minute with water of "50° to 60°" of turbidity, and that 60 to 100 liters may be filtered without building up undue resistance in a filter, which may then be cleaned by removing and brushing the first felt pad. The pump is said to create enough suction to operate from a well, depth not specified.

This design appears to be heavier, more complicated, harder to clean and operate, and less efficient from the standpoint both of output and bacterial removal, than the various "Ishii" types of self-cleaning porcelain filters used more commonly by the Japanese Army. The unusual feature is the use of the felt-paper filter. The felt serves both as prefilter and as protection for the paper. No coagulant is

used, the filter surface is vertical, the paper might easily tear under the high strains developed, and so the filter can be assumed to offer no protection against bacterial containmination. But with postchlorination it would probably produce a more potable water than chlorination alone.

Photographs: Fig. 1. Apparatus in chest, as carried, and operated

Fig. 2. Apparatus removed from chest, to show details.

Fig. 3. Cut-away view of filter material

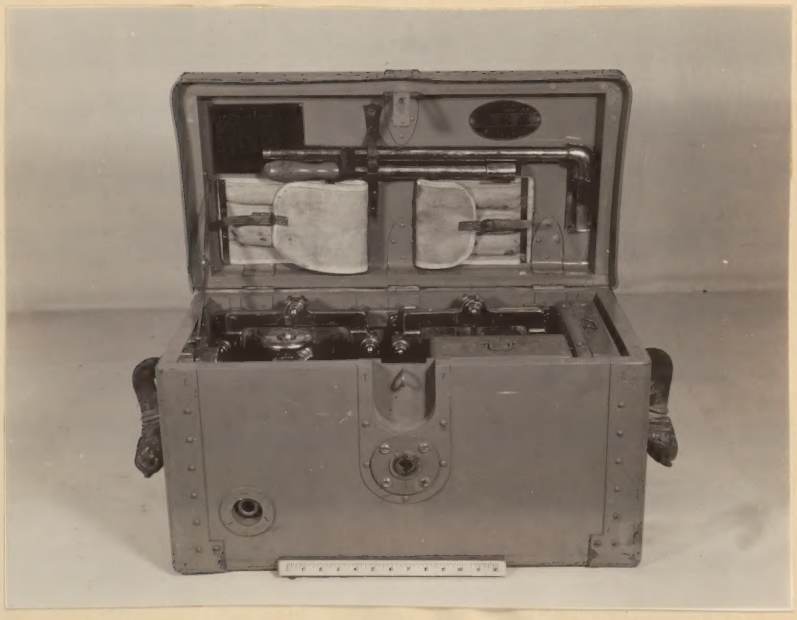

Fig. 1 - Apparatus in chest, as carried and operated.

Fig. 2 - Apparatus removed from chest to show details.

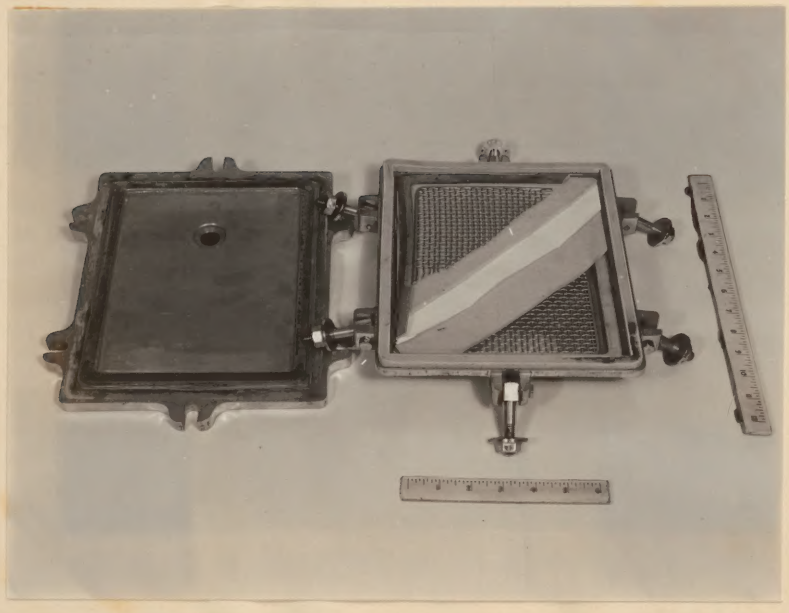

Fig. 3 - Cut-away view of filter material.